CAS LX 400
Second Language Acquisition

Week 13a. Second language acquisition of phonology

Phonological parameters

- Describing adult native-speaker phonological grammars requires abstract structures not unlike the structures required for syntax.
- Just like for syntax, differences between languages can be characterized in terms of phonological parameters.

Some basic concepts

- There is a fairly well-defined set of possible sounds that languages make use of.
- Languages differ in which of these sounds play a role in the language.
- For example, some languages have a sound like the English v, some don’t.
- The “unit of sound” is the segment.

Segment distinctions

- /p/ vs. /t/ vs. /k/ : place of articulation
- /pl/ vs. /bl/, /tl/ vs. /dl/: ±voice
- /l/ vs. /l̩/: ±continuant
- /s/ vs. /ʃ/: ±distributive
- /e/ vs. /i/: ±high
- /a/ vs. /o/: ±round
- …

Some basic concepts

- There are a lot of different things that go into determining a segment.
  - Place of articulation
  - Voicing
  - Manner of articulation
  - Aspiration
  - Tenseness/laxness of tongue
  - …

Some basic concepts

- Languages differ in what they “pay attention to” when differentiating segments from one another.
- English does not distinguish aspirated and non-aspirated consonants. The p in pit is aspirated (pʰ), the p in spit. They “sound the same” to speakers of English.
- Other languages distinguish p from ph—so pit and phit could be different words, with different meanings.
- The distinguishable segments in a language are the phonemes of the language. One parameter of variation between languages is their phonemic inventory.
R vs. L

- An oft-used example of this is the distinction between *r* vs. *l* in English and the lack of said distinction in languages like Chinese, Japanese, and Korean.
- In Korean, for example, both segments are used, but it is phonologically conditioned—between vowels, it is *r* and elsewhere it is *l*. You don’t get to choose which one you use in a given context. So there’s no distinction. (*Sunhi-lul* = […-rdl])

L1A and contrasts

- Little kids start out being able to distinguish contrasts between all possible segments, but quickly zoom in on the contrasts in their environment, losing the contrasts… Looks like a critical period, difficult for UG in L2A…
- From Werker (1994): Hindi-English

<table>
<thead>
<tr>
<th>ba ~ da</th>
<th>dʰa ~ tʰa</th>
<th>Tᵃ ~ tᵃ</th>
</tr>
</thead>
<tbody>
<tr>
<td>H adults</td>
<td>Fine</td>
<td>Fine</td>
</tr>
<tr>
<td>E infants (6-8mo)</td>
<td>Fine</td>
<td>Fine</td>
</tr>
<tr>
<td>E kids (up to 4)</td>
<td>Fine</td>
<td>Bad</td>
</tr>
<tr>
<td>E adults</td>
<td>Fine</td>
<td>Poor</td>
</tr>
</tbody>
</table>

L2A and UG

- We can ask many of the same questions we asked about syntax, but of phonology.
- Learners have an *interlanguage grammar* of phonology as well.
  - Is this grammar primarily a product of transfer?
  - Can parameters be re-set for the target language values?
  - Do interlanguage phonologies act like real languages (constrained by UG)?
- Here, it appears that transfer plays a big role and parameters are hard to re-set.

Phonological interference

- If L1’ers lose the ability to hear a contrast not in the L1, there is a strong possibility that the L1 phonology filters the L2 input.
- L2’ers may not be getting the same *data* as L1’ers.
  - If you don’t *perceive* the contrast, you won’t *acquire* the contrast.

Phonological features

- Phonologists over the years have come up with a system of (universal) features that differentiate between sounds.
  - /p/ vs. /b/ differ in [+voice].
  - /p/ vs. /f/ differ in [+continuant].
  - …
- What L1’ers seem to be doing is determining which features *contrast* in the language. If the language doesn’t distinguish voiced from voiceless consonants, L1’ers come to ignore [±voice].

Phonological features, filtering

- Japanese and Korean speakers didn’t *perceive* the *l* ~ *r* contrast, Mandarin speakers did, although none of the languages has an *l* ~ *r* contrast.
  - However, Mandarin does have other segments which differ in [+coronal] ([r]), so Mandarin speakers *do* need to distinguish [±coronal] elsewhere.
Phonological features, filtering

- Han (1992). Japanese distinguishes geminate from non-geminate stops (consonant length; k vs. kk, e.g., black owl vs. black cat). English doesn’t (*kkat vs. kat).
- English speakers of Japanese (even highly proficient otherwise) either missed this contrast altogether or produced long consonants that were not native-like (too short).

More phonological parameters: Syllables

- We have some intuitive idea of what syllables are. They are generally centered around a vowel and have some number of consonants before and after the vowel.
- The vowel part of the syllable is the nucleus. We call the initial consonant(s) the onset, and we call the trailing consonant(s) the coda.

Crosslinguistic variation

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<tr>
<th></th>
<th>V</th>
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<th>CCC</th>
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</table>

Sonority

- There is also a universal sonority hierarchy, ranking segments roughly by the amount of airflow (but really, sonority is a formal property, varies slightly from language to language seemingly depending on the phonemes distinguished).
- High sonority segments make good nuclei, low sonority segments make good onsets and codas.
  - … a > i > r > l > n > s > t …

Variation

- Languages differ in the restrictions they place on their syllables.
  - The minimum sonority of a syllable nucleus
  - The maximum sonority of a syllable onset
  - The maximum sonority of a syllable coda
  - Whether onsets are required
  - Whether complex onsets are allowed
  - Whether codas are allowed
  - Whether complex codas are allowed
  - …

- Languages also place restrictions on the sonority of segments which occur together in a consonant cluster.
  - Usually, sonority must rise to the nucleus from both directions:
    - Trunk
    - Streets
  - *Rtukn
  - Some languages make exceptions for s and th.
  - Streets
  - Sixths
  - Languages have different requirements on the sonority distance between consonants in a cluster. That is, py— is less marked than pr—.
Syllable structure
• The syllable seems to have a hierarchical structure (evidence from treatment by phonological rules—constituency). Languages differ in the details of what structures they allow—complex onsets, distinctions in vowel length, heavy codas…

Prosodic structure
• Syllables are grouped into feet (with weak and strong syllables, determining stress placement.
  – iambic ws; trochaic sw; dactylic sww, …
• Feet are then grouped into prosodic words (often coinciding with actual words), the strong syllable of a foot receiving stress, and some feet stronger than others.
  – Án.ti.dí�.e.st íb.lish.mén.tí.i.an.ís.m
• Languages differ on where the strong element of a foot is, which foot gets stronger stress, whether weight of the syllables matters…

Prosodic structure
• The prosodic structure of a word like rainbow would look something like this.

Point is…
• There’s lots of structure to phonology, and there are lots of parameters that vary from language to language.
• The parameters are often positions on a hierarchy.
• A language learner needs to learn the new parameters of phonology as well…

Broselow & Finer (1991)
• 24 native speakers of Korean, 8 native speakers of Japanese, learning English.
• Asked to produce words with initial clusters pr, br, fr, py, by, fy. E.g. puce is a color.
• Task: read definition twice to tape recorder, then later say back the right answer to questions like: Which is a color? [pju:s], [pju:t], [pju:m].
• Subjects generally did not have trouble with the single consonants.
• Subjects did well on py, pr, by clusters.
• Subjects made errors on br, fr, fy clusters.
  – Simplification, epenthesis, replacement.
• Japanese and Korean allow Cy clusters, not Cr.
• This is not straight transfer (neither pr nor br is allowed in Japanese or Korean), rather, it is governed by markedness. L2’ers are obeying universal hierarchies of markedness in their interlanguage.
Breaking up clusters

• Broselow & Park (1995): Korean does not have long vowels, CVC syllables are light. English has long vowels (and diphthongs).
  • They observed:
    - bit\text{\textumlaut{}i} ‘beat’ bit ‘bit’
    - c\text{\textumlaut{e}}ip\text{\textumlaut{i}} ‘cheap’ t\text{\textumlaut{e}}ip ‘tip’
    - p\text{\textumlaut{k}}it\text{\textumlaut{i}} ‘peak’ p\text{\textumlaut{k}}ip ‘pick’
    - rut\text{\textumlaut{e}}i ‘route’ gut ‘good’
    - k\text{\textumlaut{o}}et\text{\textumlaut{i}} ‘coat’ buk ‘book’

Breaking up clusters

• bit\text{\textumlaut{}i} ‘beat’ bit ‘bit’
  • It appears that the Korean speakers are perceiving (and remembering) the contrast between long and short vowels, but in producing them, they use essentially Korean phonology.

Archibald (1998)

• Again, focusing on L1s that do not allow complex onsets acquiring English, which does.
• Korean: [l] and [r] both produced, but they are allophones. To learn L2 English, Korean L1’ers need to acquire the distinction.
• Idea: in order to have initial consonant clusters, they will first need to acquire the distinction between l and r. That is, this is a typological fact about languages—one liquid, no complex onsets.

Archibald (1998)

• Amazonian: Sanuma: one liquid ([l]), (C)V syllables. Yagua: one liquid ([r]), CV(V) syllables.
• African: Kikuyu: one liquid ([r]), only homorganic NC clusters. Ganda: one liquid ([l]), only homorganic NC and C-glide clusters word-initially. Akan: one liquid, only homorganic NC and C-glide clusters word-initially. Nkore-Kiga: one liquid and only C-glide clusters.

Archibald (1998)

• North American: Cayuga: one liquid, some apparent [tr] and [kr] clusters, but stress facts indicate that these are not part of the same syllable.
• Mesoamerican: Proto-Uto-Aztecan: no liquids; Huichol developed one liquid, no clusters. Nahuatl developed two liquids, allows CCV syllables.

Archibald (1998)

• Creoles: Very rarely have two liquids, also very rarely have clusters. Two cases where a creole has two liquids (Russenorsk, Haitian Creole) the creole also has clusters.
• L1A? Smith (1973) provided a very famous set of data about the phonological development of his son. Order was: no clusters, “clusters” between syllables, liquid contrast, tautosyllabic clusters.
Archibald (1998)

- Archibald proposes a formal, phonological reason why acquisition of this contrast would be necessary prior to allowing clusters.
- Unfortunately, it’s still a research program; none of Archibald’s subjects had not yet acquired the contrast, and all could produce (with some errors) clusters. But his data was consistent with the ordering view, and this would make a good test for the (non-language-specific) phonological sophistication (“access to UG” in one sense—knowing what languages are like).

Metrical structure

- Getting stress on the right syllable is a complex task, making reference to the organization of syllables into feet and feet into prosodic words.
- Native speakers have a complex (parameterized) system which determines this (even for novel words). L2’ers need to acquire this as well.

Metrical structure

- Archibald (1998) gave some examples, all of which seem to indicate a strong role of transfer, and no particular evidence of setting the target parameters.
- Spanish>English: Stress systems are very similar, but some lexical exceptions in Spanish (e.g., caníbal) got transferred.
- Polish>English: Polish is quantity-insensitive, penultimate stress; so was their English.
- Hungarian>English: Hungarian is quantity-sensitive, else initial stress. Most errors were either initial stress or failing to attract stress to heavy CVC (aróma vs. ágenda).

So where are we?

- We’re not very close to answering the question Can phonological parameters be re-set in the interlanguage?
- Phonological transfer from L1 is rampant.
  - Syllable structure restrictions
  - Availability/perceptibility of contrasts
  - Non-native-like production
- Yet, some of this does seem to be overcomable with effort. Question is: are these learned or acquired?
- Also, where L2’ers are heading toward the target, they seem to follow markedness paths (they know what language is like).

So where are we?

- The perceptual issue makes phonological parameter re-setting more troublesome than in syntax.
- In syntax, you get the data, in phonology you need to overcome the L1 phonological filter before you can even get (parts of) the data.
- Recall the French example from a previous class—if you don’t hear French syllabification properly, the patterns “make no linguistic sense” and have to be memorized.

So where are we?

- Like with syntax, there are (rare) cases of late learners who native speakers find indistinguishable, but they are very rare.
- Pedagogical implications? If it is possible to acquire the phonological parameters, probably the first step would be to focus on perceiving the contrasts.
- Yet perception doesn’t necessarily guarantee productions (cf. Korean epenthesis).
So where are we?

• We know several things about L2 acquisition of phonological systems.

• We *don’t* know a huge number of other things that will be necessary to determine to what extent L2A is like L1A.